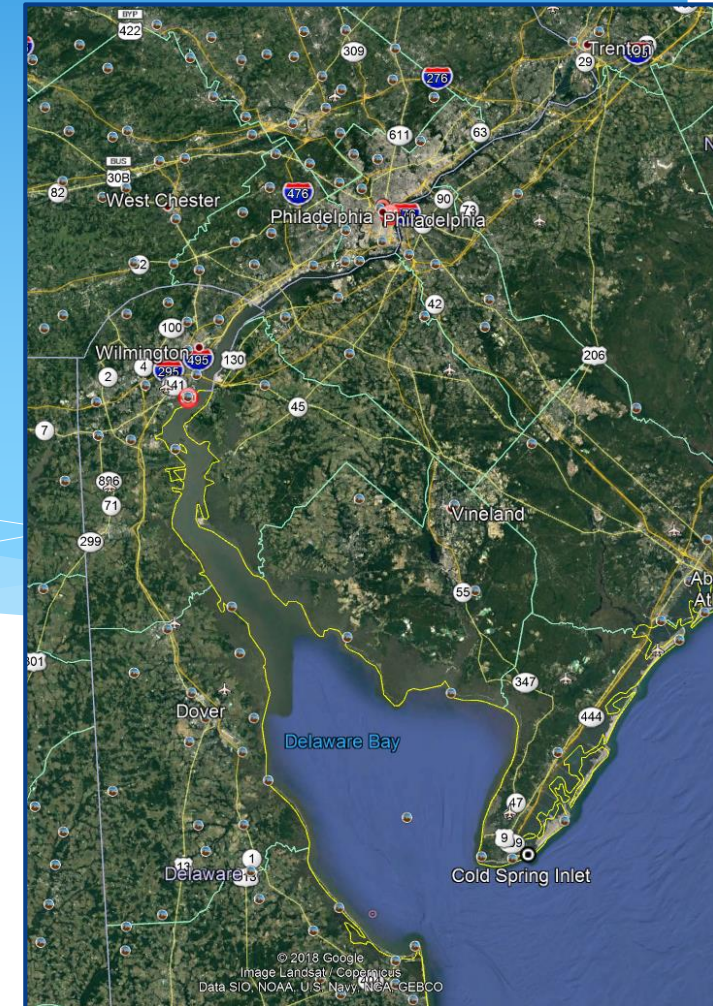


Assessing Sodium, Chloride, and TDS in near Real-Time in the Delaware Estuary



Delaware River Basin Commission

DELAWARE • NEW JERSEY
PENNSYLVANIA • NEW YORK
UNITED STATES OF AMERICA

New Jersey Water Monitoring Council
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DRBC Surface Water Quality Standards

Sodium, chloride, TDS

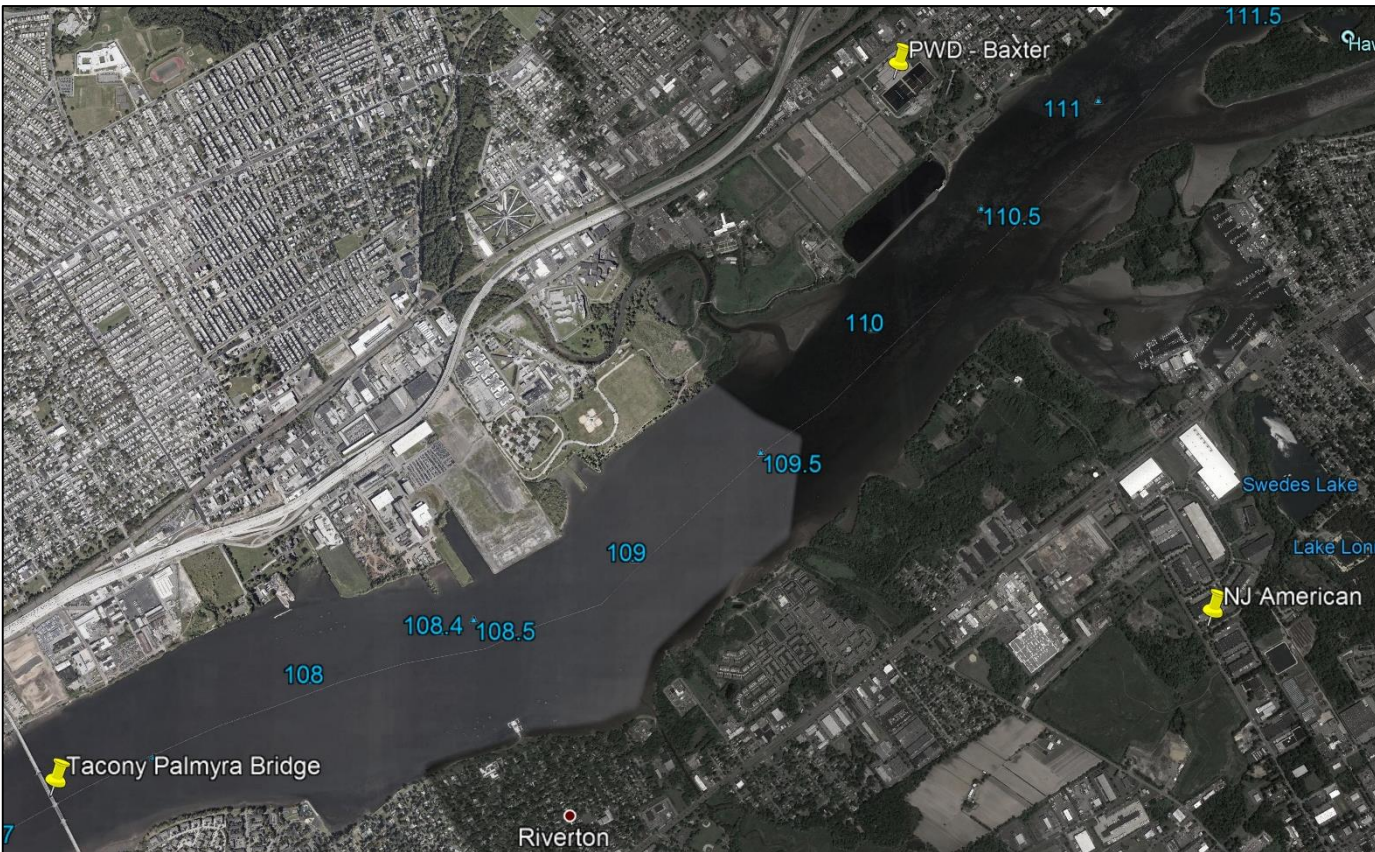
Zone 2

- * **Chlorides:** Maximum 15-day average 50 mg/l
- * **Total Dissolved Solids:** Not to exceed
 - 133 percent of background, or
 - 500 mg/l, whichever is less

Zone 3

- * **Chlorides:** Maximum 30-day average concentration of 180 mg/l at R.M. 98
- * **Sodium:** Maximum 30-day average concentration of 100 mg/l at R.M. 98
- * **Total Dissolved Solids:** Not to exceed
 - 133 percent of background, or
 - 500 mg/l, whichever is less

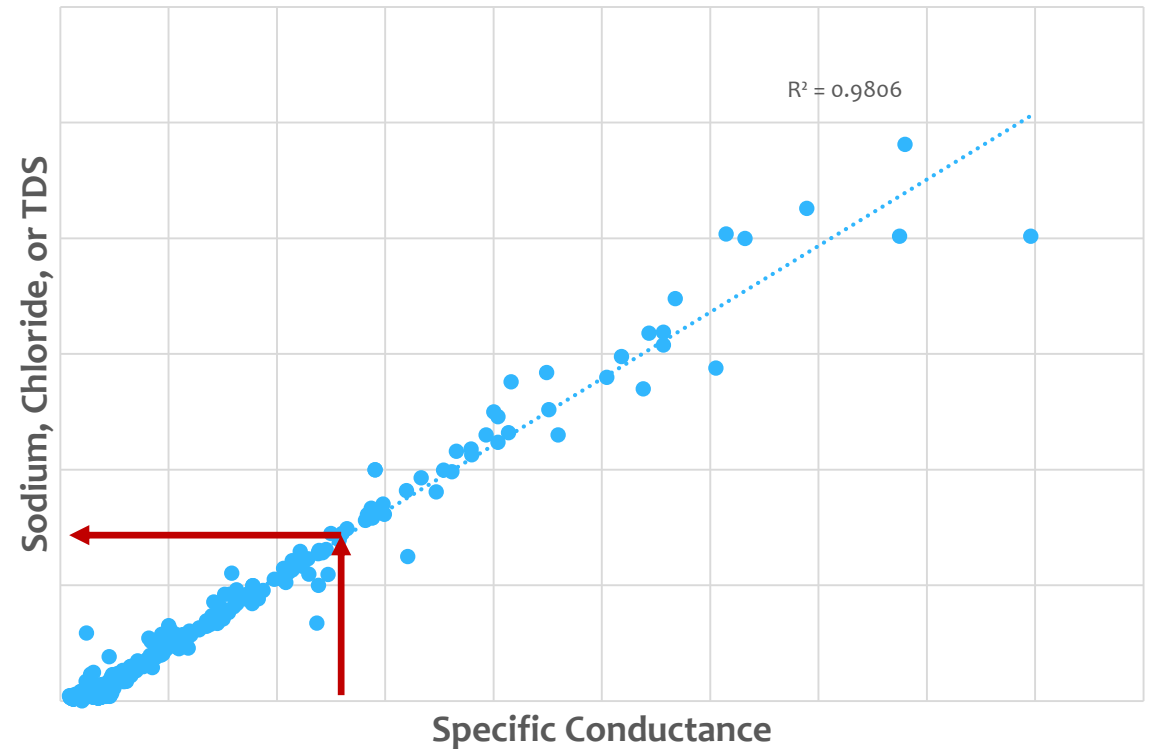
Protection of Drinking Water



- * Philadelphia & NJ American drinking water intakes in ***tidal*** freshwater
- * Sodium, chloride, TDS all important drinking water parameters
 - Health effects – hypertension
 - Corrosivity in distribution systems
- * Laboratory parameters, *but* closely correlated with specific conductance which can be measured in real time

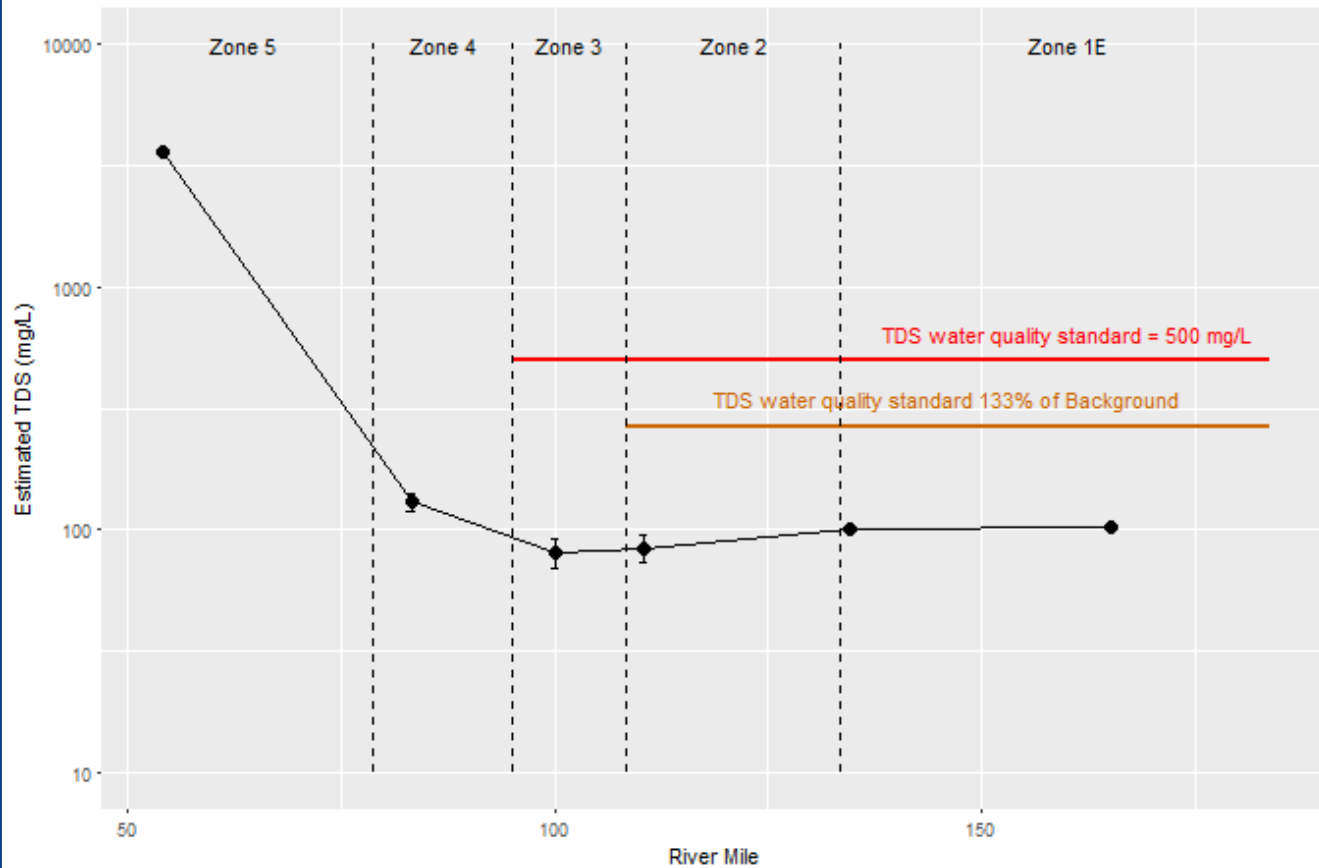
Near Real-Time Assessment Process

- * 1700+ paired measurements from DRBC estuary water quality monitoring program (boat run)
- * Scripted programs
 - Read real-time specific conductance from USGS meters
 - Apply SC to regression relationship to estimate sodium, chloride, TDS
 - Compute rolling average (if needed)
 - Plot comparisons to criteria



TDS Result

Mainstem Delaware River estimated maximum Total Dissolved Solids on 09/20/2018
Derived from USGS continuous Specific Conductance measurements

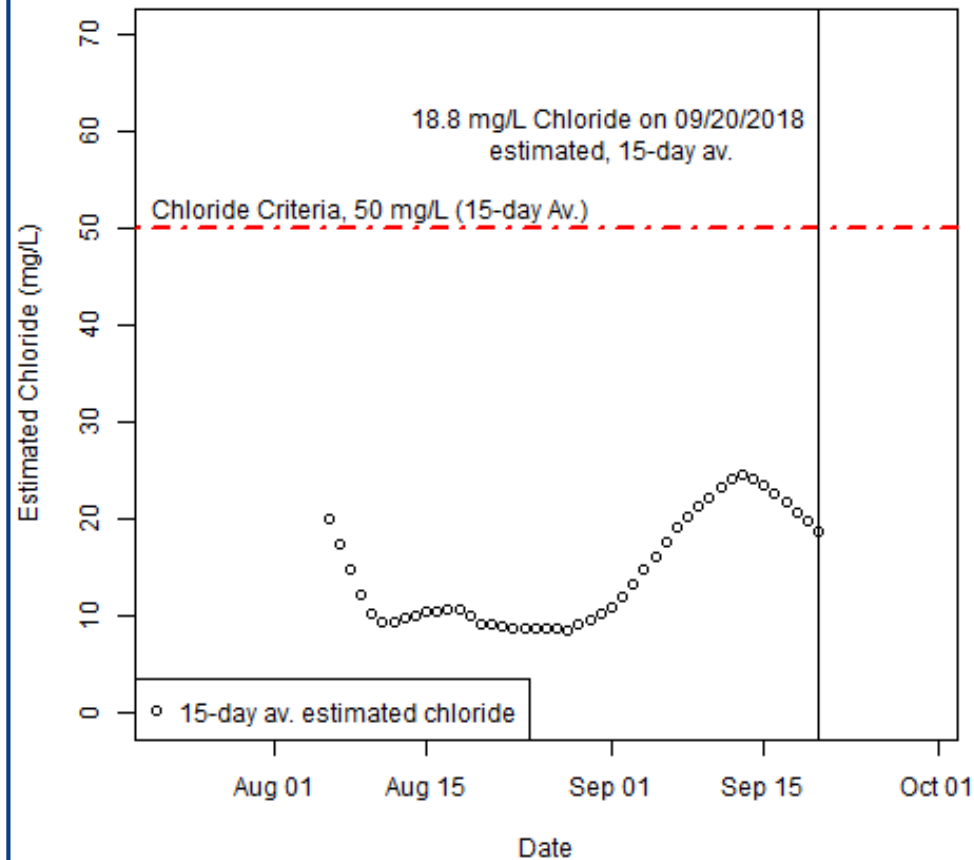


- * Assessed daily
- * Publicly available at:
<https://drbc.net/Sky/waterq.htm>
- * All inferred TDS values below all applicable criteria (good news)

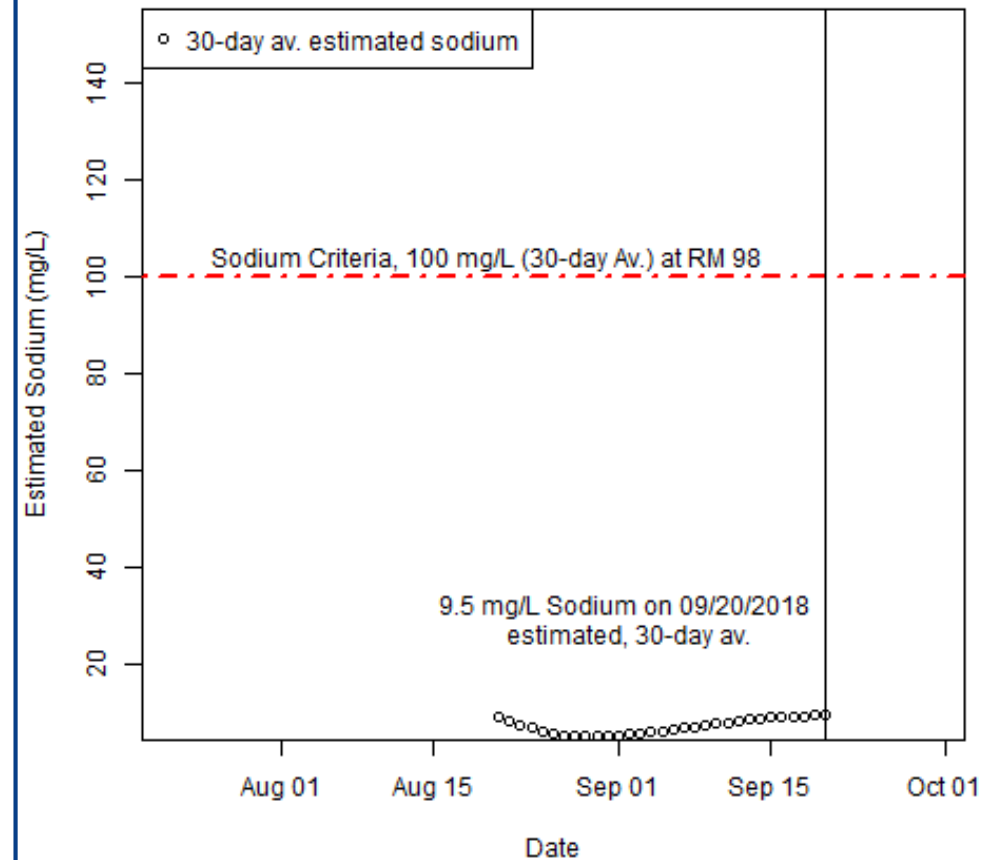
Chloride & Sodium Scans

Daily scans (not public)

**Comparison of Estimated Chloride to Criteria,
Delaware River Zone 2, as of 09/20/2018**

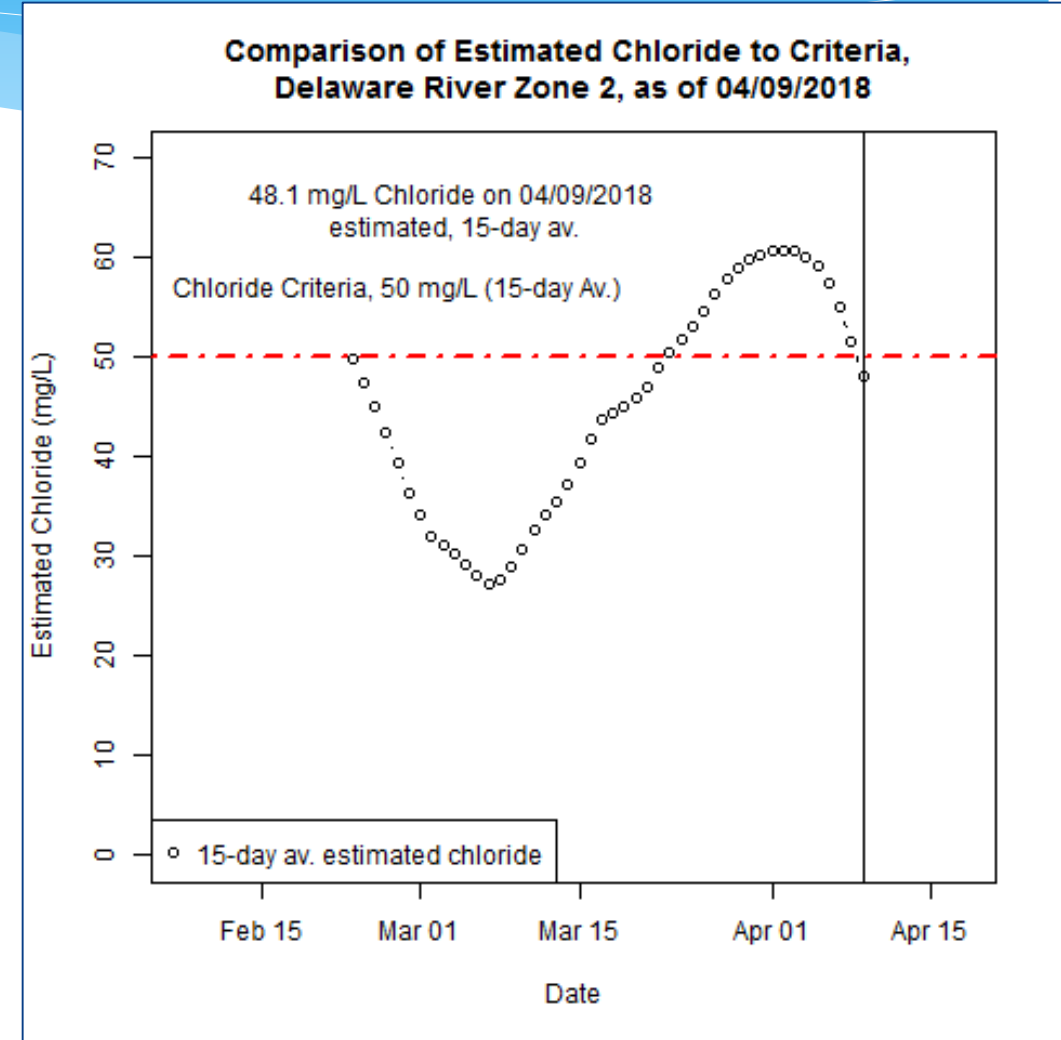


**Comparison of Estimated Sodium to Criteria,
Delaware River Zone 3, as of 09/20/2018**



Violation of Chloride Standard in April 2018

- * Coordinated with PWD & NJ American
- * Shared data
- * Able to track the onset, peak, and end of the apparent violation in near-real-time
- * Believed to be tied to road de-icing after multiple late winter snowfall



Value of Near Real-Time Assessments

- * Paper assessments indicate what happened in the past
 - Too late to respond / react
- * When we know water quality right now, we can respond:
 - Perform additional monitoring
 - Notify users
 - Operational adjustments (future)?
- Year round conductivity is being added to Ben Franklin USGS station

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Questions / Discussion?

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